

Active Objects in Interactive Mobile TV

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Abstract. The porTiVity project is developing a converged rich media iTV system, which integrates broadcast and mobile broadband delivery to portables and mobiles and which will enable the end-user to act on moving objects within TV programmes. The developments of the project include the playout of portable rich media iTV and the middleware, data and presentation engine in the handheld receiver. In this demonstration, we will present, on the production side, the Live Annotation Tool which allows the video editor to define and include active objects in Live TV Programs, and on the user side, the interaction with active objects on a mobile terminal.

1 porTiVity Live Authoring

The porTiVity project is developing a complete production chain to allow direct interaction with video objects in content broadcast to mobile devices. In other words: an object-based interactive mobile TV system [2]. Documentaries can be expanded with further details, children programs can be augmented with games, live events such as football matches may include online statistics, all extra information being at the disposal and will of the user.

This demonstration will show how porTiVity enables the video editor to create interactive programs from live broadcast with the Live Annotation Tool. Before the program, the video editor prepares the list of interesting objects and defines the relevant additional content. During the broadcast, the video editor will define the objects using the authoring interface shown in Figure 1. The input video is displayed in the top right window. At each new shot, a frozen view is automatically displayed in the object selection window for a duration of 4 seconds. This leaves sufficient time for the editor to draw a bounding box around the object, and identify the object in the available list. The object is then automatically tracked in the remaining frames of the shot, and the result is displayed in the bottom right window. Other event buttons allow the video editor to dynamically include or suppress static objects in the outgoing stream, or to stop the tracking in case of error.

The resulting information is encoded in Laser scenes, and multiplexed with the video program, then broadcasted to the end-user terminal (we will not be able to demonstrate the complete broadcast chain, due to the extensive equipment required).



Figure 1: (1) Object selection window (2) Incoming video window (3) Outgoing video window (4) Progress bar (5) Moving objects (6) Event buttons

2 End-user interaction

We will also demonstrate the interaction with a mobile terminal. The terminal receives a DVB-H stream (simulated for the demonstration), consisting of an audio, video and LAsER MPEG-4 Elementary Stream. The player for rendering the porTiVity service is based on the open source player Osmo4, which is integrated in the GPAC framework developed at ENST. The additional content, which is linked by interactive graphical elements in the LAsER DVB-H stream, can be accessed by an HTTP or Streaming Server via any broadband connection (here WiFi or UMTS). Examples of interaction can be seen on Figure



Figure 2: Children program scenario

Aknowledgements

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3 References

- [1] B. Cardoso et al, "Hyperlinked Video with Moving Objects in Digital Television", ICME 2005
- [2] Gerhard Stoll et al.. "porTiVity: New Rich Media iTV Services for Handheld TV". Workshop on the Integration of Knowledge, Semantic and Digital Media Technologies. London, 2005
- [3] H. Neuschmied, R. Trichet, and B. Mérialdo, "Fast annotation of video objects for interactive TV", ACM Multimedia 2007, 158-159.
- [4] Björn Stockleben, "Approaches towards a Mobile Interactive Platform", Euro ITV Workshop on Interactive Applications for Mobile TV, Amsterdam, May 24-25, 2007